

Modern Concepts of Cardiovascular Disease

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DR. SAMUEL A. LEVINE, Boston, *Editor*

DR. MARSHALL N. FULTON, Boston, *Associate Editor*

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DIET IN THE TREATMENT OF HEART DISEASE

Dietary regulation in heart disease has but one purpose, the same purpose that governs almost all cardiac treatment—a lessening of the work demanded of the heart. There are two ways by which this can be accomplished: first, by restricting the intake sufficiently to reduce the patient's weight, and second, by avoiding those foods which directly or indirectly tend to stimulate the heart.

The reduction of body weight is an important feature of cardiac management, for a condition of overweight alone, because of the sheer bulk of inert material to be moved, increases enormously the work demanded of the heart. Under normal conditions a fairly constant ratio of development is maintained between the myocardium and the skeletal musculature. As a person's weight increases because of greater muscular development his cardiac musculature also increases; by this means the heart maintains its competency to meet the ordinary demands of muscle work. Not so, however, if the increased weight comes from fat; there is then no compensatory increase in the strength of the heart, and this organ comes to labor under a serious handicap. More work is asked of it than it is prepared easily to perform, and, because of the circulatory embarrassment thus caused, the person so handicapped exerts himself less; this lack of exercise leads to further increase in weight, and this in turn adds still more to the burden of the heart. Thus is established a vicious circle.

Food restriction in heart disease is of importance not only for the correction of obesity but also, as was stated above, because of the more direct influence of the astoundingly brilliant results which have been achieved in restoring the relative competency of a failing heart by means of thyroidectomy give evidence of the extent to which we can lessen the work of the heart by a slowing down of metabolism. A similar effect can in some measure be accomplished by restricting the protein intake and thus reducing that stimulus to metabolism, known as the specific dynamic action, which comes from this important foodstuff. It has been demon-

strated that protein foods bring about a cardiac acceleration of surprising magnitude and duration, and that a high protein meal throws an extra burden of work upon the heart which is equivalent in energy output under fasting conditions to three or four hours of cardiac work.

Protein is our most important foodstuff. Under normal conditions the person fares best who eats liberally of good protein foods, but with an impaired myocardium the intake of protein should be limited to an amount just sufficient, with a fair margin of safety, to meet nutritive needs, for the adult, say fifty grams daily. As a matter of reassurance it can be said that the protein quota which is used to make good an existing deficit or to replace wear and tear has no specific dynamic action, and that for this reason the patient can take the amount specified above without danger of unduly accelerating his metabolism.

Carbohydrate furnishes the contracting muscle the material from which its energy is obtained and, since the heart that is laboring under a handicap should be provided with fuel in its most readily utilizable form, it seems reasonable to assume that a person with heart disease should be given liberal amounts of sugars. The correctness of this assumption is borne out by both animal experiment and clinical experience. It was found that the myocardial failure of dogs poisoned with diphtheria toxin could be relieved more satisfactorily through the intravenous injection of glucose solution than by any other means. Likewise clinical experience would indicate that sugars, particularly glucose, will give a better "pick up" to exhausted muscle than any other food. In the dietary regulation of heart disease then the rules should be: the reduction of weight when excessive, a limited quota of protein, and a liberal intake of carbohydrate.

In the reduction of weight the effort should be to force the patient to burn his own fats and at the same time preserve the integrity of the other tissues. With attention to detail this can be done. Fats should as far as possible be completely eliminated from the menu, protein should be supplied in amounts just sufficient to insure against nitro-

gen loss, say fifty or sixty grams daily, and carbohydrate given in quantities sufficient to meet the proposed caloric value of the diet. Attention must be given to the intake of vitamins and minerals. For this reason skimmed milk, orange juice, tomatoes or tomato juice, and small quantities of the leafy vegetables should always be included. The diet should never be bulky. It should be emphasized that there is no objection whatever to the inclusion in the reduction diet of small amounts of sweets, provided the calories which they supply are given full consideration. A simple dessert at the end of the chief meal gives a sense of satisfaction which will enable the patient to rest content with a smaller quantity of food than otherwise would be the case; glucose taken between meals in the form of "dextrettes" or as the little glucose "suckers" made for children will provide needed energy and prevent the mental and physical exhaustion of which these patients sometimes complain.

In choosing between the mild and the intensive reduction diets, the former should, as a rule, be preferred. For the ambulatory patient a reduction of six to eight pounds monthly is a fair objective, but if the necessity is urgent then he should be put to bed and a more rapid loss instituted, say at the rate of three or four pounds weekly. This more intensive reduction, however, should be undertaken cautiously and only when the patient is under close observation. For the milder process in the average adult an intake of 1200 to 1500 calories is usually appropriate, but it should not be forgotten that if a diet of 1000 calories is prescribed the patient not infrequently will, without consciously cheating, take about 1500 calories. It is proper therefore, as a rule, to prescribe a menu which is calculated to provide 1000 to 1200 calories. For the more intensive regimen an intake of 450 to 600 calories is provided.

Weekly weighings will, under ordinary circumstances, provide a good criterion of the adequacy of the caloric intake, but in dealing with patients with cardiac disease edema, concealed or outspoken, must be taken into account. Even in uncomplicated obesity the varying water content of the tissues can be very deceptive and if weighings are made at frequent intervals the figures may be misleading. To avoid disappointment or unwarranted encouragement it is best that the patient be weighed only at weekly intervals.

Something should be said of dietary regulation in the vascular disease which affects the heart. We cannot, in the light of present-day knowledge, retard the course of arteriosclerosis by dietary means, but we can by such means do a great deal to slow down the tempo of the patient's circulation. I hasten to add that an exception to this statement may be seen in our assumption that the coronary sclerosis of diabetes mellitus is an expression of the altered fat metabolism that follows a limited utilization of carbohydrates. This assumption may

be a bit farfetched, but it places another score against fat. The most valuable piece of advice to be given the patient with the cardiac limitation of vascular disease, such as are seen in arterial hypertension and angina pectoris, is that moderation in everything should be the keynote of his life. An important feature of this is moderation in diet. If the man who, according to newspaper reports, ate a large Sunday dinner and immediately died of "acute indigestion" had been more abstemious in diet he might have escaped his coronary occlusion. The food of the person with vascular disease should be simple, well balanced, and definitely limited in amount. He should take only wholesome foods, avoiding rich, highly seasoned dishes; his menu should not be one-sided but should be sufficiently broad to include all of the known nutritive elements; and he should eat abstemiously, never overloading his stomach. The food of the patient who is prostrate with a recent coronary occlusion, like that in pneumonia, should be such as will require in the taking, as well as in its digestion, the least possible effort.

The character of the diet will not influence directly the course of heart disease, but its well considered restriction, by relieving the heart of unnecessary effort, will indirectly increase its efficiency and thus add to the patient's comfort and perhaps prolong his life.

JAMES S. MCLESTER, M.D.,
Birmingham, Ala.

SELECTED ABSTRACT

Dock, W. Mode of Production of the First Heart Sound. *Arch. Int. Med.* 51; 737; May, 1933.

Dock reports measurements of the intensity of cardiac sounds in dogs anaesthetized and operated upon so that the inflow of blood to the heart could be controlled by clamps on the venae cavae. Even though the heart continued to beat vigorously after the venous inflow was shut off, the amplitude of the sound vibrations was markedly diminished, increasing again with return of venous inflow. From this he concludes that there is no muscular element to the first heart sound. Rather, he feels, is it due to the sudden tightening of the fibres of the A-V valves. The variation of the intensity of the first heart sound in complete heart block, its accentuation in mitral stenosis, etc., are discussed in light of this theory.

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